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*Obituary Notice of Charles Albert Ashburner.**By J. P. Lesley.**(Read before the American Philosophical Society, February 21, 1890.)*

Born at Philadelphia, February 9, 1854, and graduated at the University of Pennsylvania, June, 1874, Mr. Ashburner was elected a member of the American Philosophical Society January 16, 1880. Proud of this honor, as he justly esteemed it, he took the liveliest interest in the history, the principles and the meetings of the Society, and became the personal friend of its members, all of whom can testify to the vivacity of his zeal for science, to the geniality of his nature, and to his honor as a gentleman. Those of them who cultivated or who practiced geology, whether in its abstract or in its applied forms, will easily join me in testifying to his ability as a geologist. But no one can relate so confidently and precisely his short, brilliant career of student, field-worker, explorer, discoverer and publisher of physical truths in this branch of science, as one to whom he gave his unbroken friendship for nearly twenty years, one who received from him a thousand benefits. My gratitude for his life equals my grief at his death, and any eulogium my fellow-members accord to me the privilege of giving to his memory will seem cold and empty in comparison of his deserts; for by such examples we learn by heart the lesson, that praise of a wise good man must, after all, be left to the good and wise Creator who invented him.

This learned and ancient Society is one of the few that refuse to be chained to the service of the purely material and useful sciences; one of the few that, in these modernest times, still avouch a willingness to discuss the supernatural; to investigate the invisible and impalpable; to philosophize on the functions of soul as well as body; to protect from destruction and oblivion the claims of human virtue to precede wit and work. Therefore we hold to our traditions, and, in our quarterly elections, we prefer to the question: "Is the candidate for membership a genius or an expert?" the more important question: "Is he a just and honorable gentleman?" A genuine respect for Christianity still lingers in this hall of science; and when we place on record a memorial of some member lately lost to our meetings, we recall with more satisfaction the pleasures which his actually admirable character has contributed to our social intercourse than the profit which accrued to us from his contributions to our Transactions and Proceedings, or even than the fame which he may have won for himself and for the Society.

Governed by this, the real genius of our Society, I put in front of all Mr. Ashburner's virtues his virtue itself; in short, his Christian character, his rooted love of his kind, of just dealing, of exact truthfulness, his honesty, his generosity, his amiability, his respect for the rights and sympathy with the wrongs of other men; qualities which, in him, I know by long

and close acquaintance with him were not words, but things; not theoretical, but practical; and of these things I could reveal many instances not known to nor suspected by others. He had an exceedingly sweet and gentle nature. Had it not been for these fundamental and innate principles of character his irritable, nervous temperament would have done him and others a world of mischief. His master passion, I think, was the desire of fame; he loved above all things to be correctly understood and well and widely esteemed, but I never knew him to sacrifice either truth or justice to this passion; and I have often had occasion to wonder at the pleasure which he took, in the most child-like way, in the genuine fame of other men, even when they were his competitors. He had the great good fortune of possessing ambition as a virtue and not as a vice; and the line which his ambition took was a conduct in life having for its object the establishment of a universal confidence not so much in his ability as in his trustworthiness. It was successful. All worthy men who knew him well came to the point of trusting him implicitly, and the satisfaction he took in this was touching to those who loved him, it was so naïve, so simple hearted, so truly beautiful.

In this Society, among whose members are so many religious men, I can venture to add that Mr. Ashburner was a religious man without derogating from his reputation as a philosopher. He was a zealous Protestant Episcopalian, and, when a young man, "was an active worker in Trinity Church, West Philadelphia, showing great ability as a teacher of a large men's Bible class; and, when he moved to Pittsburgh, he became at once connected with Calvary Church." I quote these words from *The Churchman* as part of the record of his life. The writer goes on to say: "Here, as elsewhere, and in everything he did, he illustrated how a scientific student can be an earnest Christian believer, and an indefatigable man of business can find time to do Christian work and show an interest in all Church matters. It was characteristic alike of his nature, thoughtfulness and Christian character, that one of his last acts, when death was fast approaching, was to send a contribution to his rector to be used for benevolent purposes; and his devout spirit is equally attested in the fact that he received with quiet joy just before he died the memorial of his Lord's death."

Of all this I know nothing as a churchman and nothing from my personal intercourse with him, for we never broached between us a single bottle of that hot wine, theology; I respecting the genuine spiritual convictions of a young man born and bred in "The Church," and he knowing perfectly that I accepted no creed for more than a human invention, and thought no better of a good man who taught an Episcopalian Bible class than of a good man who sent in an exact record of an oil-well boring. It was quite enough for me to know that he was growing year by year into the likeness of the man Christ Jesus; and for him, that he knew that I knew it. On that basis, all our intercourse proceeded happily. And on that basis, I feel sure, rose slowly and steadily the fine structure of his

reputation, capped at last by fame. For he became famous. He became known and respected more widely in the United States and other countries than commonly happens to a man who dies in his thirty-sixth year. Yes, young and famous, worthily so.

Now, what a wonderful, what a mysterious thing it is, that while millions of old men are annually exhaled from the surface of this planet whom nobody a few miles from their temporary resting places ever heard of, and who are no more noticed when they pass away than so many drops of dew disappearing from a field of grass, it should happen that now and then when a young man dies hundreds of eyes are moist with tears and thousands of people express the most sensible and selfish regret. Usefulness is the only explanation of the phenomenon.

This is the American Philosophical Society for the Diffusion of Useful Knowledge. To that title it was born; with that title, it still lives and works. It is not a club. It is not a monastery. It is not a museum of curiosities in human form. It is not a theatre on which the vulgar, selfish passions of the heart can display themselves—vanity, pride, self-interest, dressed in their motley of untruths and antipathies. Its *raison d'être* was public usefulness; its only claim to permanence is continual usefulness. Genius is a valid claim to its membership, but only on condition of being useful to the world, and doing wrong to no man. Knowledge is a claim to its membership, but only on the conditions of modesty, kindness and usefulness. We philosophers of Philadelphia belong by name at least to a utilitarian school of philosophy. Our motto is *pro bono publico*. Every member of this Society should adopt as the leading principles of his knowledge, *non sibi sed toti*. In Syria, the chief ceremonial was the anniversary celebration of the death of Adonis; this Society should have an annual celebration of the death of the personal selfishness of each and all of its members. Self-sacrifice is a *sine qua non* for usefulness.

Therefore, thinking thus; much as I esteemed Ashburner for his personal, manly and Christian virtues, I admired him most of all for his usefulness, his perpetual and varied usefulness, in so many ways, to so large a number of persons. His restless energy was useful to the old and the sluggish; his masterful will was useful to the young, the reckless and the insubordinate. His accurate methods of investigation, his patient, exhaustive observation of facts, his indefatigable coördination and discussion of them to avoid false generalizations, his dogged perseverance in every attempt to devise the very best apparatus and arrange the very best method for the useful publication of the knowledge he thus won—these made him not only a master of subjects in his branch of science, but a master of less able men, whom he thereby helped largely to educate. But he took special delight and exhibited his greatest skill in “diffusing useful knowledge”—a genuine child of Franklin—a worthy member of this Society. In season and out of season he kept on diffusing useful knowledge, knowing the best ways of doing it. He had not a spark of

false pride about it. He never acted or spoke as a savant. He did not in the least know how to speak to the public *de haut en bas*. He went straight in, everywhere, and at all times, for spreading the useful knowledge he had accumulated, much of it by his own discoveries, *pro bono publico*.

Mr. Ashburner was educated at Friends' Central School, the Philadelphia High School and the Towne Scientific School of the University of Pennsylvania. While an undergraduate, he was one of a party who made a survey of Delaware river and bay for Government purposes. His special course in the University was civil engineering, and he was graduated first in his class. He began his professional career in the service of the United States Light House Board. The year following the installation of the Second Geological Survey of Pennsylvania (1874) he was commissioned as one of the aids to Mr. Dewees, Assistant Geologist for the Juniata River district. Mr. Dewees confined his attention to the fossil ore beds, leaving Mr. Ashburner and Mr. Charles E. Billin to make a survey and contour map of the south slope of Jack's mountain and the little valleys and ridges between it and the river. The excellence of this map proved the value of the severe drill they had had in the drawing room of the geological department of the Towne School, and the admirable instruction of Prof. Haupt. Their cross-sections at Logan's Gap, Lewistown, McGeesville, Mount Union, etc., published in "Report of Progress F," in 1878, are among the most perfect and beautiful works of that kind in the literature of our science in this or any other country.

The same kind of work was afterwards carried on by them south-westward into Huntingdon county, as far as Orbisonia and Three Springs. The beautiful maps and sections of this Aughwick division of the district, and the accurate discussion of the cross-faults at those two places, so thoroughly established their reputation as field geologists, that separate districts were assigned to them as independent Assistant Geologists on the survey; to Mr. Billin, the complicated region of the Seven Mountains, in Snyder, Union, Lycoming, Centre and East Huntingdon counties; and to Mr. Ashburner, Sideling hill and East Broad Top Coal basin, in West Huntingdon county. Here again his maps and sections showed that he combined the qualities of geologist and artist in the highest degree.

In 1876, he was commissioned to survey McKean county with the Bradford oil region; and afterwards Elk, Cameron, and Forest counties. Two years were spent in this work, ably assisted by Mr. Arthur W. Sheaffer. His report on McKean with many illustrations, including a complete contour map of the county, was published, as "Report of Progress R," in 1880; and his second report on the other three counties (RR) in 1885, being delayed by his survey of the anthracite region and the necessity for revisions and additions which he deemed it necessary to make himself.

In 1880, he was commissioned to plan the long-delayed survey of the anthracite coal fields of Eastern Pennsylvania. His plans were approved, and that survey was placed in his hands. He himself selected his corps of

able assistants; established his offices at several points of the region; entered into personal relations with railroad and coal companies; made friends and correspondents of all the civil and mining engineers, colliery managers, superintendents, and mine bosses; laid out a general map of the region; planned its division into sheets to be successively published; and gradually, by a wise and skillful system of proof reading of each advance sheet by all intelligent interested parties previous to actual printing, he acquired the entire confidence and respect of the mining community.

The sheets that appeared with his first report on the Panthar Creek basin (the east end of the Southern field, between the Lehigh and Little Schuylkill rivers) showed what was to be expected of this great geological survey. Those of the Northern field (Wyoming basin), of the Eastern Middle field (Beaver Meadow group), and of the Western Middle field (Mahanoy and Shamokin basins) followed during the years 1881 to 1887, when he resigned his commission to accept business relations with Mr. Westinghouse, of Pittsburgh, as geological expert of his companies.

Previous to this, however, Mr. Ashburner had a heavier load laid upon him, for he acted as responsible First Assistant Geologist of the State Survey, and had a general supervision of all that went on in the State, being the trusted adviser and executive officer of the State Geologist. The anthracite survey was finished by his accomplished first assistant, Mr. Frank A. Hill, who resigned with all the other members of the corps, June 1, 1889, the term fixed by the last act of Legislature for the completion of the work of the Survey.

Mr. Ashburner, for two years before his death, was chiefly occupied in visiting and reporting upon supposed new oil and gas regions in Canada and the United States, and also upon gold and copper properties in the Rocky Mountain regions. On his last return from Arizona he fell ill and suddenly died at his home in Pittsburgh, at the age of thirty-six, leaving a wife and two children, and a multitude of ardent friends and admiring acquaintances, to lament an irreparable loss.

His contributions to the current literature of his science may be found in the Proceedings of this Society under the titles: "On Kintzie's Fire-damp Indicator," Vol. xxi, p. 283; "Notes on the Natural Bridge of Virginia," xxi, 699; "Remarks on the Recent Publications of the Geological Survey of Pennsylvania," xxii, 86.

He was a member of the American Institute of Mining Engineers from 1875, and one of its managers in 1885, 1886, and 1887; and his papers will be found in its Transactions, entitled: "The Bradford Oil District," vii, 316; "The Bragos Coal Field, Texas," ix, 495; "New Method of Mapping the Anthracite Coal Fields of Pennsylvania," ix, 506; "The Flannery Boiler setting for the Prevention of Smoke," x, 212; "The Anthracite Coal Beds of Pennsylvania," xi, 20; "The Product and Exhaustion of the Oil Regions of Pennsylvania and New York," xiv, 419; "The Geology of Natural Gas," xiv, 428; "The Classification and Constitution of Penn-

sylvania Anthracites," xiv, 706 ; "The Geological Distribution of Natural Gas in the United States," xv, 565 ; "The Geological Relations of the Nanticoke Disaster," xv, 629 ; "Coal Production in Utah," xvi, 356 ; "Petroleum and Natural Gas in New York State," xvi, 906 ; "The Development and Statistics of the Alabama Coal Fields for 1887," xvii, 206 ; "The Geology of Buffalo, as related to Natural Gas ; Explorations along the Niagara River," xvii, 398 ; "Statistics of Coal Mining and of Miners' Wages in the United States," xviii (*in press*) ; "Natural Gas Explorations on the Ontario Peninsular" (*in press*). A "Biographical Notice of Captain W. R. Jones, of Pittsburgh," is among his unpublished papers.

But his lasting fame will depend more upon his "Reports of Progress of the Geological Survey of Pennsylvania," and the sheets of the "Anthracite Coal Fields," than upon the admirable generalizations in the papers mentioned above, proofs as they are of the healthy maturity of his native genius for a true and broad synthesis of facts. It was in recognition of the high value of his Reports that the University of Pennsylvania conferred on him the degree of Doctor of Science.

Were I called to enumerate his actual discoveries, I should begin with that of the curious ninety-foot side-throw in the Black Log Mountain gap at Orbisonia, dying out at each end of the fault. It is worthy of special notice as the only cross-fault as yet detected in any of the many mountain gaps of the State, and as throwing a clear light upon the curious system of throws encountered by the Rock Hill Iron and Coal Company in driving their gangways westward, showing that the whole district had been subjected to a warp movement fracturing it in parallel lines at right angles to the strike.

Then I would cite the Three Springs fault in the same district of Southern Huntingdon county, exhibiting the same features, but with a maximum side-throw at the present surface of 1200 feet. In "Report F" will be found his beautiful geometrical construction of this fault in the underground, determining its extent in depth.

I would cite also his discovery of the unsuspected subcarboniferous coal measures in the Pocono (Vespertine) formation, No. X, cut by the East Broad Top railroad through Sideling hill in the same county. The immediate appreciation of the great importance of this revelation, by so young a field worker, was the best evidence of his scientific genius that could be given ; and his section of these very curious coal beds at the dawn of the Coal Age has been our guide through a most difficult chapter of Appalachian geology.

Of equal importance to the petroleum industry was his discovery of the increase in thickness of the Pocono formation, overlying the Bradford oil formation, southward into Elk and Cameron counties, for it fully explained the failures of oil-well sinkers to reach the oil horizon which they sought by rule of thumb, supposing that the same number of feet would avail them in all parts of that region.

His determination that the Salamanca conglomerate of New York was

much lower in the series than the Olean conglomerate of Pennsylvania was another important contribution to our knowledge.

But his best discoveries were in the Anthracite region. He revolutionized our old ideas of the cross-sections; discovered the most remarkable overlaps and plication faults in the bottoms of the synclinals; and in a word differentiated the simple structure of Whelpley and McKinley into a complicated series of unexpected irregularities; giving precisely that knowledge to the colliery engineers which they most needed.

Another important discovery resulted from his later work for Mr. Westinghouse in the Catskill region of New York, viz., that the great Ordovician (Siluro-Cambrian) limestone formation, topped by the Trenton, was greatly thicker than had been supposed, and consequently that its supposed thinning out from Pennsylvania northward towards Canada was, in a good degree, a mistake. Subsequently he was able to substantiate this important fact over a wider field in the West.

Lastly, I would cite his discovery of the true general rate of rise of the Palæozoic formations from Pennsylvania into Canada West, by his discussion of the recent borings on the south shore of Lake Ontario and the north and south shores of Lake Erie. The slope from Franklin to Erie had been pretty well fixed in 1840; and Carll's measurements had made the rate more accurate; but we have it now in a perfectly reliable form, with a constant that cannot be well altered.

His discovery that some of the western petroleum comes from the drift was one of many minor additions to our knowledge made by this admirable field geologist, who has passed away in his prime, yet so young, leaving us only to regret that our science has not a larger store of them.

Obituary Notice of Henry Simmons Frieze, LL.D.

By James B. Angell, Ann Arbor, Mich.

(Read before the American Philosophical Society, March 7, 1890.)

Henry Simmons Frieze, LL.D., was born in Boston, Mass., September 15, 1817, and died in Ann Arbor, Mich., December 7, 1889. He was the son of Jacob Frieze and Betsy (Slade) Frieze. His father, who was a native of Rhode Island, and, during most of his life, a resident of that State, was for several years the pastor of Universalist churches in Massachusetts and in Rhode Island. Subsequently, he became an editorial writer for newspapers in Providence, and in the days when pamphlets were one of the main instruments in political warfare, he was somewhat noted in Rhode Island for his skill as a pamphleteer.

The son was obliged at an early age to gain his own livelihood. He served first as a clerk in Providence, and then engaged in teaching music